SEQUENCE LISTING

<110> BASLER, Konrad
BRUNNER, Erich
FROESCH, Barbara
KRAMPS, Thomas
PETER, Oliver

<120> ESSENTIAL DOWNSTREAM COMPONENT OF THE WINGLESS SIGNALING PATHWAY AND THERAPEUTIC AND DIAGNOSTIC APPLICATIONS BASED THEREON

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                          Glu Ile Ser Ser Asn Lys Ala Lys Gly
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Gln Ala Ala Gly Gly Gly Cys Glu Thr Gly Ser Thr Ser Ser Leu Thr
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Gly Ala Gly Thr Gly Asn Leu Leu Thr Ala Asn Ala Asn Gly Ile Ser
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Ser Gly Gln Phe Gln Thr Ile Ile Ala Tyr His Cys Thr Gln Pro Ala
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Trp Glu Gly Gly Ser Ser Asn Thr Ser Arg Ser Gly Gln Asn Ser Arg
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Asn His Val Asp Ser Ile Ser Thr Ser Ser Glu Ser Gln Ala Ile Lys
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Ile Leu Glu Ala Ala Gly Val Asp Leu Gly Gln Val Thr Lys Gly Ser
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Asp Pro Gly Leu Thr Thr Glu Asn Asn Ile Val Ser Leu Gln Gly Val
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Pro Gly Asp Leu Met Met Gly Met Ser Gly Gly Gly Gly Gly Ser Ile
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Ile Asn Pro Thr Met Arg Gln Leu His Met Pro Gly Asn Ala Lys Ser
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Ser Lys Glu Val Leu Asn Gln Asp Ser Arg Thr His Ser His Gln Gly
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Arg Ser Ala Ser Val Pro Ile Ala Thr Gln Ser Pro Asn Pro Ser Ser
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Arg Pro Ser Pro Gln Gly Gln Arg Ser Pro Val Asn Ser Leu Ile Glu
        900                 905                 910

gca aat aaa gat gta cga ttt gct gca tcc agt cct ggt ttt aac ccg     4795
Ala Asn Lys Asp Val Arg Phe Ala Ala Ser Ser Pro Gly Phe Asn Pro
    915                 920                 925

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His Pro His Met Gln Ser Asn Ser Asn Ser Ala Leu Asn Ala Tyr Lys
930                 935                 940                 945

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Gly Gly Ser Val Gln Phe Ser Arg Arg Ser Asp Asn Ile Pro Leu Asn
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Val Ser  Ser Met Gly Ser Pro  Ala Gly Thr Gly Gly  Met Thr Met
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Met Gly  Gly Pro Gly Pro Ser  Asp Ile Asn Ile Glu  His Gly Ile
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Met Leu  Asn Pro Lys Met Cys  Val Ala Gly Gly Pro  Asn Gly Pro
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cct ggc  ttt aat cct aat tcc  ccc aat ggt gga tta  aga gag aat      5358
Pro Gly  Phe Asn Pro Asn Ser  Pro Asn Gly Gly Leu  Arg Glu Asn
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Ser Ile  Gly Ser Gly Cys Gly  Ser Ala Asn Ser Ser  Asn Phe Gln
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Thr Pro  Asn Thr Ile Gln Tyr  Met Pro Val Arg Ala  Gln Asn Ala
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Ser Leu  Glu Phe Leu Gln Arg  Tyr Ala Asn Pro Gln  Met Gly Ala
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Val Gly  Asn Gly Ser Pro Ile  Cys Pro Pro Ser Ala  Ser Asp Gly
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Thr Pro  Gly Met Pro Gly Leu  Met Ala Gly Pro Gly  Ala Gly Gly
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Met Leu  Met Asn Ser Ser Gly  Glu Gln His Gln Asn  Lys Ile Thr
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Asp Gly  Ser Met Asn Ile Gly  Gln Pro Ser Met Ile  Arg Gly Met
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Arg Pro  His Ala Met Arg Pro  Asn Val Met Gly Ala  Arg Met Pro
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ccc gtt  aac agg caa att cag  ttt gca cag tca tcg  gat ggt att      5988
Pro Val  Asn Arg Gln Ile Gln  Phe Ala Gln Ser Ser  Asp Gly Ile
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Asp Cys  Val Gly Asp Pro Ser  Ser Phe Phe Thr Asn  Ala Ser Cys
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Asn Ser  Ala Gly Pro His Met  Phe Gly Ser Ala Gln  Gln Ala Asn
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His Gly  Gln Gly His Ala Gln  Gly Gln Ser Leu Ile  Gly Pro Thr
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aat aat  aat tta atg tca act  gcc gga agt gtc agt  gct act aac      6258
Asn Asn  Asn Leu Met Ser Thr  Ala Gly Ser Val Ser  Ala Thr Asn
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ggt gtc  tct ggc atc aat ttc  gta ggt ccc tct tct  acg gac ctg      6303
Gly Val  Ser Gly Ile Asn Phe  Val Gly Pro Ser Ser  Thr Asp Leu
    1400                 1405                 1410

aag tat  gcc cag caa tat cat  agt ttt cag cag cag  tta tat gct      6348
Lys Tyr  Ala Gln Gln Tyr His  Ser Phe Gln Gln Gln  Leu Tyr Ala
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acc aac  acc aga agt caa caa  caa cag cat atg cac  cag cag cac      6393
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aaaatatata tataaatgta aaacgctatt gatatatatt gctctcaact gtattgtaat  6846

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<213> Drosophila lgs

<400> 2

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Ile Phe Val Phe Ser Thr Gln Leu Ala Asn Lys Gly Ala Glu Ser Val
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Leu Ser Gly Gln Phe Gln Thr Ile Ile Ala Tyr His
            20                  25
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<210> 3
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<212> PRT
<213> Human lgs/bcl9

<400> 3

Val Tyr Val Phe Ser Thr Glu Met Ala Asn Lys Ala Ala Glu Ala Val
1 5 10 15

Leu Lys Gly Gln Val Glu Thr Ile Val Ser Phe His
20 25

<210> 4
<211> 35
<212> PRT
<213> Drosophila lgs

<400> 4

Glu Asn Leu Thr Pro Gln Gln Arg Gln His Arg Glu Glu Gln Leu Ala
1 5 10 15

Lys Ile Lys Lys Met Asn Gln Phe Leu Phe Pro Glu Asn Glu Asn Ser
20 25 30

Val Gly Ala
35

<210> 5
<211> 35
<212> PRT
<213> Human lgs/bcl9

<400> 5

Asp Gly Leu Ser Gln Glu Gln Leu Glu His Arg Glu Arg Ser Leu Gln
1 5 10 15

Thr Leu Arg Asp Ile Gln Arg Met Leu Phe Pro Asp Glu Lys Glu Phe
20 25 30

Thr Gly Ala
35

<210> 6
<211> 15

<212> PRT
<213> Drosophila lgs

<400> 6

Gln Met Glu Trp Ser Lys Ile Gln His Gln Phe Phe Glu Glu Arg
1 5 10 15

<210> 7
<211> 15
<212> PRT
<213> Human lgs/bcl9

<400> 7

Gln Ile Ala Trp Leu Lys Leu Gln Gln Glu Phe Tyr Glu Glu Lys
1 5 10 15

<210> 8
<211> 9
<212> PRT
<213> Drosophila lgs

<400> 8

Leu Gln Gly Pro Pro Pro Pro Tyr His
1 5

<210> 9
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<212> PRT
<213> Human lgs/bcl9

<400> 9

Val Arg Gly Pro Pro Pro Pro Tyr Gln
1 5

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<212> PRT
<213> Drosophila lgs

<400> 10

Ser Ala Ser Val Pro Ile Ala Thr Gln Ser Pro Asn Pro Ser Ser Pro

1 5 10 15

Asn Asn Leu Ser Leu Pro Ser Pro Arg Thr Thr Ala Ala Val Met Gly
20 25 30

Leu Pro Thr Asn Ser Pro Ser Met Asp Gly Thr Gly Ser Leu Ser Gly
35 40 45

Ser Val Pro Gln Ala Asn Thr Ser Thr Val Gln Ala Gly Thr Thr Thr
50 55 60

Val Leu Ser Ala Asn Lys Asn Cys Phe Gln Ala Asp Thr Pro Ser Pro
65 70 75 80

Ser Asn Gln Asn Arg Ser Arg Asn Thr Gly Ser Ser Ser Val Leu Thr
85 90 95

His Asn Leu Ser Ser Asn Pro Ser Thr Pro Leu Ser His Leu Ser Pro
100 105 110

<210> 11
<211> 111
<212> PRT
<213> Human lgs/bcl9

<400> 11

Gly Pro Pro Pro Pro Thr Ala Ser Gln Pro Ala Ser Val Asn Ile Pro
1 5 10 15

Gly Ser Leu Pro Ser Ser Thr Pro Tyr Thr Met Pro Pro Glu Pro Thr
20 25 30

Leu Ser Gln Asn Pro Leu Ser Ile Met Met Ser Arg Met Ser Lys Phe
35 40 45

Ala Met Pro Ser Ser Thr Pro Leu Tyr His Asp Ala Ile Lys Thr Val
50 55 60

Ala Ser Ser Asp Asp Asp Ser Pro Pro Ala Arg Ser Pro Asn Leu Pro
65 70 75 80

Ser Met Asn Asn Met Pro Gly Met Gly Ile Asn Thr Gln Asn Pro Arg
85 90 95

Ile Ser Gly Pro Asn Pro Val Val Pro Met Pro Thr Leu Ser Pro
100 105 110

<210> 12
<211> 16
<212> PRT
<213> Drosophila lgs

<400> 12

Asn Pro Lys Met Cys Val Ala Gly Gly Pro Asn Gly Pro Pro Gly Phe
1 5 10 15

<210> 13
<211> 16
<212> PRT
<213> Human lgs/bcl9

<400> 13

Asp Ala Ala Leu Cys Lys Pro Gly Gly Pro Gly Gly Pro Asp Ser Phe
1 5 10 15

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<212> PRT
<213> Human lgs/bcl9

<400> 15

Met His Ser Ser Asn Pro Lys Val Arg Ser Ser Pro Ser Gly Asn Thr
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Gln Ser Ser Pro Lys Ser Lys Gln Glu Val Met Val Arg Pro Pro Thr
20 25 30

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Val Met Ser Pro Ser Gly Asn Pro Gln Leu Asp Ser Lys Phe Ser Asn
        35                  40                  45

Gln Gly Lys Gln Gly Gly Ser Ala Ser Gln Ser Gln Pro Ser Pro Cys
    50                  55                  60

Asp Ser Lys Ser Gly Gly His Thr Pro Lys Ala Leu Pro Gly Pro Gly
65                  70                  75                  80

Gly Ser Met Gly Leu Lys Asn Gly Ala Gly Asn Gly Ala Lys Gly Lys
                85                  90                  95

Gly Lys Arg Glu Arg Ser Ile Ser Ala Asp Ser Phe Asp Gln Arg Asp
            100                 105                 110

Pro Gly Thr Pro Asn Asp Asp Ser Asp Ile Lys Glu Cys Asn Ser Ala
        115                 120                 125

Asp His Ile Lys Ser Gln Asp Ser Gln His Thr Pro His Ser Met Thr
    130                 135                 140

Pro Ser Asn Ala Thr Ala Pro Arg Ser Ser Thr Pro Ser His Gly Gln
145                 150                 155                 160

Thr Thr Ala Thr Glu Pro Thr Pro Ala Gln Lys Thr Pro Ala Lys Val
                165                 170                 175

Val Tyr Val Phe Ser Thr Glu Met Ala Asn Lys Ala Ala Glu Ala Val
            180                 185                 190

Leu Lys Gly Gln Val Glu Thr Ile Val Ser Phe His Ile Gln Asn Ile
        195                 200                 205

Ser Asn Asn Lys Thr Glu Arg Ser Thr Ala Pro Leu Asn Thr Gln Ile
    210                 215                 220

Ser Ala Leu Arg Asn Asp Pro Lys Pro Leu Pro Gln Gln Pro Pro Ala
225                 230                 235                 240
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Pro Ala Asn Gln Asp Gln Asn Ser Ser Gln Asn Thr Arg Leu Gln Pro
245 250 255

Thr Pro Pro Ile Pro Ala Pro Ala Pro Lys Pro Ala Ala Pro Pro Arg
260 265 270

Pro Leu Asp Arg Glu Ser Pro Gly Val Glu Asn Lys Leu Ile Pro Ser
275 280 285

Val Gly Ser Pro Ala Ser Ser Thr Pro Leu Pro Pro Asp Gly Thr Gly
290 295 300

Pro Asn Ser Thr Pro Asn Asn Arg Ala Val Thr Pro Val Ser Gln Gly
305 310 315 320

Ser Asn Ser Ser Ser Ala Asp Pro Lys Ala Pro Pro Pro Pro Pro Val
325 330 335

Ser Ser Gly Glu Pro Pro Thr Leu Gly Glu Asn Pro Asp Gly Leu Ser
340 345 350

Gln Glu Gln Leu Glu His Arg Glu Arg Ser Leu Gln Thr Leu Arg Asp
355 360 365

Ile Gln Arg Met Leu Phe Pro Asp Glu Lys Glu Phe Thr Gly Ala Gln
370 375 380

Ser Gly Gly Pro Gln Gln Asn Pro Gly Val Leu Asp Gly Pro Gln Lys
385 390 395 400

Lys Pro Glu Gly Pro Ile Gln Ala Met Met Ala Gln Ser Gln Ser Leu
405 410 415

Gly Lys Gly Pro Gly Pro Arg Thr Asp Val Gly Ala Pro Phe Gly Pro
420 425 430

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Gln Gly His Arg Asp Val Pro Phe Ser Pro Asp Glu Met Val Pro Pro
        435                 440                 445

Ser Met Asn Ser Gln Ser Gly Thr Ile Gly Pro Asp His Leu Asp His
    450                 455                 460

Met Thr Pro Glu Gln Ile Ala Trp Leu Lys Leu Gln Gln Glu Phe Tyr
465                 470                 475                 480

Glu Glu Lys Arg Arg Lys Gln Glu Gln Val Val Val Gln Gln Cys Ser
                485                 490                 495

Leu Gln Asp Met Met Val His Gln His Gly Pro Arg Gly Val Val Arg
            500                 505                 510

Gly Pro Pro Pro Pro Tyr Gln Met Thr Pro Ser Glu Gly Trp Ala Pro
        515                 520                 525

Gly Gly Thr Glu Pro Phe Ser Asp Gly Ile Asn Met Pro His Ser Leu
    530                 535                 540

Pro Pro Arg Gly Met Ala Pro His Pro Asn Met Pro Gly Ser Gln Met
545                 550                 555                 560

Arg Leu Pro Gly Phe Ala Gly Met Ile Asn Ser Glu Met Glu Gly Pro
                565                 570                 575

Asn Val Pro Asn Pro Ala Ser Arg Pro Gly Leu Ser Gly Val Ser Trp
            580                 585                 590

Pro Asp Asp Val Pro Lys Ile Pro Asp Gly Arg Asn Phe Pro Pro Gly
        595                 600                 605

Gln Gly Ile Phe Ser Gly Pro Gly Arg Gly Glu Arg Phe Pro Asn Pro
    610                 615                 620

Gln Gly Leu Ser Glu Glu Met Phe Gln Gln Gln Leu Ala Glu Lys Gln
625                 630                 635                 640
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Leu Gly Leu Pro Pro Gly Met Ala Met Glu Gly Ile Arg Pro Ser Met
645 650 655

Glu Met Asn Arg Met Ile Pro Gly Ser Gln Arg His Met Glu Pro Gly
660 665 670

Asn Asn Pro Ile Phe Pro Arg Ile Pro Val Glu Gly Pro Leu Ser Pro
675 680 685

Ser Arg Gly Asp Phe Pro Lys Gly Ile Pro Pro Gln Met Gly Pro Gly
690 695 700

Arg Glu Leu Glu Phe Gly Met Val Pro Ser Gly Met Lys Gly Asp Val
705 710 715 720

Asn Leu Asn Val Asn Met Gly Ser Asn Ser Gln Met Ile Pro Gln Lys
725 730 735

Met Arg Glu Ala Gly Ala Gly Pro Glu Glu Met Leu Lys Leu Arg Pro
740 745 750

Gly Gly Ser Asp Met Leu Pro Ala Gln Gln Lys Met Val Pro Leu Pro
755 760 765

Phe Gly Glu His Pro Gln Gln Glu Tyr Gly Met Gly Pro Arg Pro Phe
770 775 780

Leu Pro Met Ser Gln Gly Pro Gly Ser Asn Ser Gly Leu Arg Asn Leu
785 790 795 800

Arg Glu Pro Ile Gly Pro Asp Gln Arg Thr Asn Ser Arg Leu Ser His
805 810 815

Met Pro Pro Leu Pro Leu Asn Pro Ser Ser Asn Pro Thr Ser Leu Asn
820 825 830

```
Thr Ala Pro Pro Val Gln Arg Gly Leu Gly Arg Lys Pro Leu Asp Ile
        835                 840                 845

Ser Val Ala Gly Ser Gln Val His Ser Pro Gly Ile Asn Pro Leu Lys
    850                 855                 860

Ser Pro Thr Met His Gln Val Gln Ser Pro Met Leu Gly Ser Pro Ser
865                 870                 875                 880

Gly Asn Leu Lys Ser Pro Gln Thr Pro Ser Gln Leu Ala Gly Met Leu
                885                 890                 895

Ala Gly Pro Ala Ala Ala Ala Ser Ile Lys Ser Pro Pro Val Leu Gly
            900                 905                 910

Ser Ala Ala Ala Ser Pro Val His Leu Lys Ser Pro Ser Leu Pro Ala
        915                 920                 925

Pro Ser Pro Gly Trp Thr Ser Ser Pro Lys Pro Pro Leu Gln Ser Pro
    930                 935                 940

Gly Ile Pro Pro Asn His Lys Ala Pro Leu Thr Met Ala Ser Pro Ala
945                 950                 955                 960

Met Leu Gly Asn Val Glu Ser Gly Gly Pro Pro Pro Pro Thr Ala Ser
                965                 970                 975

Gln Pro Ala Ser Val Asn Ile Pro Gly Ser Leu Pro Ser Ser Thr Pro
            980                 985                 990

Tyr Thr Met Pro Pro Glu Pro Thr  Leu Ser Gln Asn Pro  Leu Ser Ile
        995                 1000                1005

Met Met  Ser Arg Met Ser Lys  Phe Ala Met Pro Ser  Ser Thr Pro
    1010                1015                1020

Leu Tyr  His Asp Ala Ile Lys  Thr Val Ala Ser Ser  Asp Asp Asp
    1025                1030                1035
```

Ser Pro Pro Ala Arg Ser Pro Asn Leu Pro Ser Met Asn Asn Met
1040 1045 1050

Pro Gly Met Gly Ile Asn Thr Gln Asn Pro Arg Ile Ser Gly Pro
1055 1060 1065

Asn Pro Val Val Pro Met Pro Thr Leu Ser Pro Met Gly Met Thr
1070 1075 1080

Gln Pro Leu Ser His Ser Asn Gln Met Pro Ser Pro Asn Ala Val
1085 1090 1095

Gly Pro Asn Ile Pro Pro His Gly Val Pro Met Gly Pro Gly Leu
1100 1105 1110

Met Ser His Asn Pro Ile Met Gly His Gly Ser Gln Glu Pro Pro
1115 1120 1125

Met Val Pro Gln Gly Arg Met Gly Phe Pro Gln Gly Phe Pro Pro
1130 1135 1140

Val Gln Ser Pro Pro Gln Gln Val Pro Phe Pro His Asn Gly Pro
1145 1150 1155

Ser Gly Gly Gln Gly Ser Phe Pro Gly Gly Met Gly Phe Pro Gly
1160 1165 1170

Glu Gly Pro Leu Gly Arg Pro Ser Asn Leu Pro Gln Ser Ser Ala
1175 1180 1185

Asp Ala Ala Leu Cys Lys Pro Gly Gly Pro Gly Gly Pro Asp Ser
1190 1195 1200

Phe Thr Val Leu Gly Asn Ser Met Pro Ser Val Phe Thr Asp Pro
1205 1210 1215

Asp Leu Gln Glu Val Ile Arg Pro Gly Ala Thr Gly Ile Pro Glu
1220 1225 1230

Phe Asp Leu Ser Arg Ile Ile Pro Ser Glu Lys Pro Ser Gln Thr
1235 1240 1245

Leu Gln Tyr Phe Pro Arg Gly Glu Val Pro Gly Arg Lys Gln Pro
1250 1255 1260

Gln Gly Pro Gly Pro Gly Phe Ser His Met Gln Gly Met Met Gly
1265 1270 1275

Glu Gln Ala Pro Arg Met Gly Leu Ala Leu Pro Gly Met Gly Gly
1280 1285 1290

Pro Gly Pro Val Gly Thr Pro Asp Ile Pro Leu Gly Thr Ala Pro
1295 1300 1305

Ser Met Pro Gly His Asn Pro Met Arg Pro Pro Ala Phe Leu Gln
1310 1315 1320

Gln Gly Met Met Gly Pro His His Arg Met Met Ser Pro Ala Gln
1325 1330 1335

Ser Thr Met Pro Gly Gln Pro Thr Leu Met Ser Asn Pro Ala Ala
1340 1345 1350

Ala Val Gly Met Ile Pro Gly Lys Asp Arg Gly Pro Ala Gly Leu
1355 1360 1365

Tyr Thr His Pro Gly Pro Val Gly Ser Pro Gly Met Met Met Ser
1370 1375 1380

Met Gln Gly Met Met Gly Pro Gln Gln Asn Ile Met Ile Pro Pro
1385 1390 1395

Gln Met Arg Pro Arg Gly Met Ala Ala Asp Val Gly Met Gly Gly
1400 1405 1410

Phe Ser Gln Gly Pro Gly Asn Pro Gly Asn Met Met Phe
1415 1420 1425

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tcctcccaga tgatgccctt ccccccctcgg ctgcagcagc cccatggtgc catggccccc 2580

actgggggtg ggggcggggg gcctggcctg cagcagcact acccgtcagg catggccctg 2640

cctcccgagg acctgcccaa ccagccgcca ggccccatgc ctccccagca gcacctgatg 2700

ggcaaagcca tggctgggcg catgggcgac gcatacccac cgggtgtgct ccctggggtg 2760

gcatcagtgc tgaacgaccc cgagctgagc gaggtgatcc ggcccacccc aacggggatc 2820

cccgagttcg acttgtcgag gatcatcccc tctgagaagc caagcagcac cctccagtac 2880

ttccccaaga gcgagaacca gccccccaag gctcagcccc ctaatctgca tctcatgaac 2940

ctgcagaaca tgatggcgga gcagactccc tctcggcctc ccaacctccc aggccagcag 3000

ggcgatcggc cgctggtggt ggtgataccg ggtacccggg ctatggcgcc ggcgcagcgc 3060

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cagcggcagc tgaaggaggc tttggagagg ctcctgcccc aggtggaggc ggcccgcaag 3180

gccatccgcg ccgctcaggt ggagcgctat gtgcccgaac acgagcgatg ctgctggtgc 3240

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tgggagaaca aagctgaggt ccagatgaaa gagaagtttc tggtcactcc ccaggattat 3420

gcgcgattca agaaatccat ggtgaaaggt ttggattcct atgaagaaaa ggaggataaa 3480

gtgatcaagg agatggcagc tcagatccgt gaggtggagc agagccgaca ggaggtggtt 3540

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caagctcggt gcctctgcgc cccccgcagg ggcgccctca agcctgagcc ccccgggcgc 3720

accctcaagc tcggtgtacc cccccatacc acccgcaagg cgcgccctca tgccgcgaag 3780

acttcgcccc gcccaaggtg cacccgtcaa gccccgaata aaacccagtc actccaactt 3840

gcaggcaaag ctagaaaaac tgcgctgcat ttgcaaacaa aagctcttgt tggcgatgac 3900

gatactgttt tgggtgtgaa actgtcaatt gctaactacg atctgtga 3948

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<211> 1115
<212> PRT
<213> Human lgs-1

<400> 17

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Thr Tyr Ser Pro Glu Thr Ser Arg Arg Lys Leu Pro Gln Ala Pro Lys
            20                  25                  30

Ala Ser Phe Leu Gly Gln Gln Gly Arg Val Ile Trp Lys Pro Leu Ser
        35                  40                  45

Glu Glu Leu Arg Asp Gln Gly Ala Asp Ala Ala Gly Gly Pro Ala Ser
    50                  55                  60

Ile Met Ser Pro Ile Ala Thr Val Asn Ala Ser Gly Leu Ser Lys Glu
65                  70                  75                  80

Gln Leu Glu His Arg Glu Arg Ser Leu Gln Thr Leu Arg Asp Ile Glu
                85                  90                  95

Arg Leu Leu Leu Arg Ser Gly Glu Thr Glu Pro Phe Leu Lys Gly Ala
            100                 105                 110

Pro Arg Arg Ser Gly Gly Leu Lys Lys Tyr Glu Glu Pro Leu Gln Ser
        115                 120                 125

Met Ile Ser Gln Thr Gln Ser Leu Gly Gly Pro Pro Leu Glu His Glu
    130                 135                 140

Val Pro Gly His Pro Pro Gly Gly Asp Met Gly Gln Gln Met Asn Met
145                 150                 155                 160

Met Ile Gln Arg Leu Gly Gln Asp Ser Leu Thr Pro Glu Gln Val Ala
                165                 170                 175

Trp Arg Lys Leu Gln Glu Glu Tyr Tyr Glu Glu Lys Arg Arg Lys Glu
            180                 185                 190
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Glu Gln Ile Gly Leu His Gly Ser Arg Pro Leu Gln Asp Met Met Gly
195 200 205

Met Gly Gly Met Met Val Arg Gly Pro Pro Pro Pro Tyr His Ser Lys
210 215 220

Pro Gly Asp Gln Trp Pro Pro Gly Met Gly Ala Gln Leu Arg Gly Pro
225 230 235 240

Met Asp Val Gln Asp Pro Met Gln Leu Arg Gly Gly Pro Pro Phe Pro
245 250 255

Gly Pro Arg Phe Pro Gly Asn Gln Ile Gln Arg Val Pro Gly Phe Gly
260 265 270

Gly Met Gln Ser Met Pro Met Glu Val Pro Met Asn Ala Met Gln Arg
275 280 285

Pro Val Arg Pro Gly Met Gly Trp Thr Glu Asp Leu Pro Pro Met Gly
290 295 300

Gly Pro Ser Asn Phe Ala Gln Asn Thr Met Pro Tyr Pro Gly Gly Gln
305 310 315 320

Gly Glu Ala Glu Arg Phe Met Thr Pro Arg Val Arg Glu Glu Leu Leu
325 330 335

Arg His Gln Leu Leu Glu Lys Arg Ser Met Gly Met Gln Arg Pro Leu
340 345 350

Gly Met Ala Gly Ser Gly Met Gly Gln Ser Met Glu Met Glu Arg Met
355 360 365

Met Gln Ala His Arg Gln Met Asp Pro Ala Met Phe Pro Gly Gln Met
370 375 380

Ala Gly Gly Glu Gly Leu Ala Gly Thr Pro Met Gly Met Glu Phe Gly
385 390 395 400

Gly Gly Arg Gly Leu Leu Ser Pro Pro Met Gly Gln Ser Gly Leu Arg
405 410 415

Glu Val Asp Pro Pro Met Gly Pro Gly Asn Leu Asn Met Asn Met Asn
420 425 430

Val Asn Met Asn Met Asn Met Asn Leu Asn Val Gln Met Thr Pro Gln
435 440 445

Gln Gln Met Leu Met Ser Gln Lys Met Arg Gly Pro Gly Asp Leu Met
450 455 460

Gly Pro Gln Gly Leu Ser Pro Glu Glu Met Ala Arg Val Arg Ala Gln
465 470 475 480

Asn Ser Ser Gly Met Val Pro Leu Pro Ser Ala Asn Pro Pro Gly Pro
485 490 495

Leu Lys Ser Pro Gln Val Leu Gly Ser Ser Leu Ser Val Arg Ser Pro
500 505 510

Thr Gly Ser Pro Ser Arg Leu Lys Ser Pro Ser Met Ala Val Pro Ser
515 520 525

Pro Gly Trp Val Ala Ser Pro Lys Thr Ala Met Pro Ser Pro Gly Val
530 535 540

Ser Gln Asn Lys Gln Pro Pro Leu Asn Met Asn Ser Ser Thr Thr Leu
545 550 555 560

Ser Asn Met Glu Gln Asp Pro Thr Pro Ser Gln Asn Pro Leu Ser Leu
565 570 575

Met Met Thr Gln Met Ser Lys Tyr Ala Met Pro Ser Ser Thr Pro Leu
580 585 590

Tyr His Asn Ala Ile Lys Thr Ile Ala Thr Ser Asp Asp Glu Leu Leu
595 600 605

Pro Asp Arg Pro Leu Leu Pro Pro Pro Pro Pro Pro Gln Gly Ser Gly
610 615 620

Pro Gly Gly Pro Asp Ser Leu Asn Ala Pro Cys Gly Pro Val Pro Ser
625 630 635 640

Ser Ser Gln Met Met Pro Phe Pro Pro Arg Leu Gln Gln Pro His Gly
645 650 655

Ala Met Ala Pro Thr Gly Gly Gly Gly Gly Gly Pro Gly Leu Gln Gln
660 665 670

His Tyr Pro Ser Gly Met Ala Leu Pro Pro Glu Asp Leu Pro Asn Gln
675 680 685

Pro Pro Gly Pro Met Pro Pro Gln Gln His Leu Met Gly Lys Ala Met
690 695 700

Ala Gly Arg Met Gly Asp Ala Tyr Pro Pro Gly Val Leu Pro Gly Val
705 710 715 720

Ala Ser Val Leu Asn Asp Pro Glu Leu Ser Glu Val Ile Arg Pro Thr
725 730 735

Pro Thr Gly Ile Pro Glu Phe Asp Leu Ser Arg Ile Ile Pro Ser Glu
740 745 750

Lys Pro Ser Ser Thr Leu Gln Tyr Phe Pro Lys Ser Glu Asn Gln Pro
755 760 765

Pro Lys Ala Gln Pro Pro Asn Leu His Leu Met Asn Leu Gln Asn Met
770 775 780

Met Ala Glu Gln Thr Pro Ser Arg Pro Pro Asn Leu Pro Gly Gln Gln
785 790 795 800

Gly Asp Arg Pro Leu Val Val Val Ile Pro Gly Thr Arg Ala Met Ala
805 810 815

Pro Ala Gln Arg Cys Pro Leu Cys Arg Gln Thr Phe Phe Cys Gly Arg
820 825 830

Gly His Val Tyr Ser Arg Lys His Gln Arg Gln Leu Lys Glu Ala Leu
835 840 845

Glu Arg Leu Leu Pro Gln Val Glu Ala Ala Arg Lys Ala Ile Arg Ala
850 855 860

Ala Gln Val Glu Arg Tyr Val Pro Glu His Glu Arg Cys Cys Trp Cys
865 870 875 880

Leu Cys Cys Gly Cys Glu Val Arg Glu His Leu Ser His Gly Asn Leu
885 890 895

Thr Val Leu Tyr Gly Gly Leu Leu Glu His Leu Ala Ser Pro Glu His
900 905 910

Lys Lys Ala Thr Asn Lys Phe Trp Trp Glu Asn Lys Ala Glu Val Gln
915 920 925

Met Lys Glu Lys Phe Leu Val Thr Pro Gln Asp Tyr Ala Arg Phe Lys
930 935 940

Lys Ser Met Val Lys Gly Leu Asp Ser Tyr Glu Glu Lys Glu Asp Lys
945 950 955 960

Val Ile Lys Glu Met Ala Ala Gln Ile Arg Glu Val Glu Gln Ser Arg
965 970 975

Gln Glu Val Val Arg Ser Val Leu Glu Thr Gly Pro Pro Arg Tyr Ala
980 985 990

Leu Thr Val Arg Ser Pro Ala Val Leu Ser Arg Arg Thr Leu Lys Ser
995 1000 1005

Gly Ala Phe Pro Pro Gln Thr Pro Glu Ala His Pro Gln Ala Arg
1010 1015 1020

Cys Leu Cys Ala Pro Arg Arg Gly Ala Leu Lys Pro Glu Pro Pro
1025 1030 1035

Gly Arg Thr Leu Lys Leu Gly Val Pro Pro His Thr Thr Arg Lys
1040 1045 1050

Ala Arg Pro His Ala Ala Lys Thr Ser Pro Arg Pro Arg Cys Thr
1055 1060 1065

Arg Gln Ala Pro Asn Lys Thr Gln Ser Leu Gln Leu Ala Gly Lys
1070 1075 1080

Ala Arg Lys Thr Ala Leu His Leu Gln Thr Lys Ala Leu Val Gly
1085 1090 1095

Asp Asp Asp Thr Val Leu Gly Val Lys Leu Ser Ile Ala Asn Tyr
1100 1105 1110

Asp Leu
1115

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<213> Artificial Sequence

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<223> T7 Promoter containing dsRNA-lgs-R1

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<210> 19
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
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<220>
<221> misc_structure
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<223> dsRNA-lgs-F1

<400> 19
taatacgact cactataggg agaccactag gatctctcga caacaatg 48

<210> 20
<211> 49
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<220>
<223> F Primer

<220>
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<223> F Primer

<400> 20
taatacgact cactataggg agaccacaca agaccaagtg gacgatatg 49

<210> 21
<211> 48
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<212> DNA
<213> Artificial Sequence

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<220>
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<223> T7 Promoter

<400> 22
taatacgact cactataggg agaccac 27

<210> 23
<211> 1464
<212> PRT
<213> Drosophila lgs

<400> 23

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Ser Ser Thr Ser Ala Ser Gly Ser Asn Pro Gly Ala Ala Ile Gly Asn
20 25 30

Gly Asp Ser Ala Ala Ser Arg Ser Ser Pro Lys Thr Leu Asn Ser Glu
35 40 45

Pro Phe Ser Thr Leu Ser Pro Asp Gln Ile Lys Leu Thr Pro Glu Glu
50 55 60

Gly Thr Glu Lys Ser Gly Leu Ser Thr Ser Asp Lys Ala Ala Thr Gly

65 70 75 80

Gly Ala Pro Gly Ser Gly Asn Asn Leu Pro Glu Gly Gln Thr Met Leu
85 90 95

Arg Gln Asn Ser Thr Ser Thr Ile Asn Ser Cys Leu Val Ala Ser Pro
100 105 110

Gln Asn Ser Ser Glu His Ser Asn Ser Ser Asn Val Ser Ala Thr Val
115 120 125

Gly Leu Thr Gln Met Val Asp Cys Asp Glu Gln Ser Lys Lys Asn Lys
130 135 140

Cys Ser Val Lys Asp Glu Glu Ala Glu Ile Ser Ser Asn Lys Ala Lys
145 150 155 160

Gly Gln Ala Ala Gly Gly Gly Cys Glu Thr Gly Ser Thr Ser Ser Leu
165 170 175

Thr Val Lys Glu Glu Pro Thr Asp Val Leu Gly Ser Leu Val Asn Met
180 185 190

Lys Lys Glu Glu Arg Glu Asn His Ser Pro Thr Met Ser Pro Val Gly
195 200 205

Phe Gly Ser Ile Gly Asn Ala Gln Asp Asn Ser Ala Thr Pro Val Lys
210 215 220

Ile Glu Arg Ile Ser Asn Asp Ser Thr Thr Glu Lys Lys Gly Ser Ser
225 230 235 240

Leu Thr Met Asn Asn Asp Glu Met Ser Met Glu Gly Cys Asn Gln Leu
245 250 255

Asn Pro Asp Phe Ile Asn Glu Ser Leu Asn Asn Pro Ala Ile Ser Ser
260 265 270

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Ile Leu Val Ser Gly Val Gly Pro Ile Pro Gly Ile Gly Val Gly Ala
        275                 280                 285

Gly Thr Gly Asn Leu Leu Thr Ala Asn Ala Asn Gly Ile Ser Ser Gly
    290                 295                 300

Ser Ser Asn Cys Leu Asp Tyr Met Gln Gln Gln Asn His Ile Phe Val
305                 310                 315                 320

Phe Ser Thr Gln Leu Ala Asn Lys Gly Ala Glu Ser Val Leu Ser Gly
                325                 330                 335

Gln Phe Gln Thr Ile Ile Ala Tyr His Cys Thr Gln Pro Ala Thr Lys
            340                 345                 350

Ser Phe Leu Glu Asp Phe Phe Met Lys Asn Pro Leu Lys Ile Asn Lys
        355                 360                 365

Leu Gln Arg His Asn Ser Val Gly Met Pro Trp Ile Gly Met Gly Gln
    370                 375                 380

Val Gly Leu Thr Pro Pro Asn Pro Val Ala Lys Ile Thr Gln Gln Gln
385                 390                 395                 400

Pro His Thr Lys Thr Val Gly Leu Leu Lys Pro Gln Phe Asn Gln His
                405                 410                 415

Glu Asn Ser Lys Arg Ser Thr Val Ser Ala Pro Ser Asn Ser Phe Val
            420                 425                 430

Asp Gln Ser Asp Pro Met Gly Asn Glu Thr Glu Leu Met Cys Trp Glu
        435                 440                 445

Gly Gly Ser Ser Asn Thr Ser Arg Ser Gly Gln Asn Ser Arg Asn His
    450                 455                 460

Val Asp Ser Ile Ser Thr Ser Ser Glu Ser Gln Ala Ile Lys Ile Leu
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465                 470                 475                 480

Glu Ala Ala Gly Val Asp Leu Gly Gln Val Thr Lys Gly Ser Asp Pro
                485                 490                 495

Gly Leu Thr Thr Glu Asn Asn Ile Val Ser Leu Gln Gly Val Lys Val
            500                 505                 510

Pro Asp Glu Asn Leu Thr Pro Gln Gln Arg Gln His Arg Glu Glu Gln
        515                 520                 525

Leu Ala Lys Ile Lys Lys Met Asn Gln Phe Leu Phe Pro Glu Asn Glu
    530                 535                 540

Asn Ser Val Gly Ala Asn Val Ser Ser Gln Ile Thr Lys Ile Pro Gly
545                 550                 555                 560

Asp Leu Met Met Gly Met Ser Gly Gly Gly Gly Gly Ser Ile Ile Asn
                565                 570                 575

Pro Thr Met Arg Gln Leu His Met Pro Gly Asn Ala Lys Ser Glu Leu
            580                 585                 590

Leu Ser Ala Thr Ser Ser Gly Leu Ser Glu Asp Val Met His Pro Gly
        595                 600                 605

Asp Val Ile Ser Asp Met Gly Ala Val Ile Gly Cys Asn Asn Asn Gln
    610                 615                 620

Lys Thr Ser Val Gln Cys Gly Ser Gly Val Gly Val Val Thr Gly Thr
625                 630                 635                 640

Thr Ala Ala Gly Val Asn Val Asn Met His Cys Ser Ser Ser Gly Ala
                645                 650                 655

Pro Asn Gly Asn Met Met Gly Ser Ser Thr Asp Met Leu Ala Ser Phe
            660                 665                 670
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Gly Asn Thr Ser Cys Asn Val Ile Gly Thr Ala Pro Asp Met Ser Lys
        675                 680                 685

Glu Val Leu Asn Gln Asp Ser Arg Thr His Ser His Gln Gly Gly Val
    690                 695                 700

Ala Gln Met Glu Trp Ser Lys Ile Gln His Gln Phe Phe Glu Glu Arg
705                 710                 715                 720

Leu Lys Gly Gly Lys Pro Arg Gln Val Thr Gly Thr Val Val Pro Gln
                725                 730                 735

Gln Gln Thr Pro Ser Gly Ser Gly Gly Asn Ser Leu Asn Asn Gln Val
            740                 745                 750

Arg Pro Leu Gln Gly Pro Pro Pro Pro Tyr His Ser Ile Gln Arg Ser
        755                 760                 765

Ala Ser Val Pro Ile Ala Thr Gln Ser Pro Asn Pro Ser Ser Pro Asn
    770                 775                 780

Asn Leu Ser Leu Pro Ser Pro Arg Thr Thr Ala Ala Val Met Gly Leu
785                 790                 795                 800

Pro Thr Asn Ser Pro Ser Met Asp Gly Thr Gly Ser Leu Ser Gly Ser
                805                 810                 815

Val Pro Gln Ala Asn Thr Ser Thr Val Gln Ala Gly Thr Thr Thr Val
            820                 825                 830

Leu Ser Ala Asn Lys Asn Cys Phe Gln Ala Asp Thr Pro Ser Pro Ser
        835                 840                 845

Asn Gln Asn Arg Ser Arg Asn Thr Gly Ser Ser Ser Val Leu Thr His
    850                 855                 860

Asn Leu Ser Ser Asn Pro Ser Thr Pro Leu Ser His Leu Ser Pro Lys
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865 870 875 880

Glu Phe Glu Ser Phe Gly Gln Ser Ser Ala Gly Asp Asn Met Lys Ser
885 890 895

Arg Arg Pro Ser Pro Gln Gly Gln Arg Ser Pro Val Asn Ser Leu Ile
900 905 910

Glu Ala Asn Lys Asp Val Arg Phe Ala Ala Ser Ser Pro Gly Phe Asn
915 920 925

Pro His Pro His Met Gln Ser Asn Ser Asn Ser Ala Leu Asn Ala Tyr
930 935 940

Lys Met Gly Ser Thr Asn Ile Gln Met Glu Arg Gln Ala Ser Ala Gln
945 950 955 960

Gly Gly Ser Val Gln Phe Ser Arg Arg Ser Asp Asn Ile Pro Leu Asn
965 970 975

Pro Asn Ser Gly Asn Arg Pro Pro Pro Asn Lys Met Thr Gln Asn Phe
980 985 990

Asp Pro Ile Ser Ser Leu Ala Gln Met Ser Gln Gln Leu Thr Ser Cys
995 1000 1005

Val Ser Ser Met Gly Ser Pro Ala Gly Thr Gly Gly Met Thr Met
1010 1015 1020

Met Gly Gly Pro Gly Pro Ser Asp Ile Asn Ile Glu His Gly Ile
1025 1030 1035

Ile Ser Gly Leu Asp Gly Ser Gly Ile Asp Thr Ile Asn Gln Asn
1040 1045 1050

Asn Cys His Ser Met Asn Val Val Met Asn Ser Met Gly Pro Arg
1055 1060 1065

Met Leu Asn Pro Lys Met Cys Val Ala Gly Gly Pro Asn Gly Pro
1070 1075 1080

Pro Gly Phe Asn Pro Asn Ser Pro Asn Gly Gly Leu Arg Glu Asn
1085 1090 1095

Ser Ile Gly Ser Gly Cys Gly Ser Ala Asn Ser Ser Asn Phe Gln
1100 1105 1110

Gly Val Val Pro Pro Gly Ala Arg Met Met Gly Arg Met Pro Val
1115 1120 1125

Asn Phe Gly Ser Asn Phe Asn Pro Asn Ile Gln Val Lys Ala Ser
1130 1135 1140

Thr Pro Asn Thr Ile Gln Tyr Met Pro Val Arg Ala Gln Asn Ala
1145 1150 1155

Asn Asn Asn Asn Asn Asn Gly Ala Asn Asn Val Arg Met Pro Pro
1160 1165 1170

Ser Leu Glu Phe Leu Gln Arg Tyr Ala Asn Pro Gln Met Gly Ala
1175 1180 1185

Val Gly Asn Gly Ser Pro Ile Cys Pro Pro Ser Ala Ser Asp Gly
1190 1195 1200

Thr Pro Gly Met Pro Gly Leu Met Ala Gly Pro Gly Ala Gly Gly
1205 1210 1215

Met Leu Met Asn Ser Ser Gly Glu Gln His Gln Asn Lys Ile Thr
1220 1225 1230

Asn Asn Pro Gly Ala Ser Asn Gly Ile Asn Phe Phe Gln Asn Cys
1235 1240 1245

Asn Gln Met Ser Ile Val Asp Glu Glu Gly Gly Leu Pro Gly His

1250 1255 1260

Asp Gly Ser Met Asn Ile Gly Gln Pro Ser Met Ile Arg Gly Met
1265 1270 1275

Arg Pro His Ala Met Arg Pro Asn Val Met Gly Ala Arg Met Pro
1280 1285 1290

Pro Val Asn Arg Gln Ile Gln Phe Ala Gln Ser Ser Asp Gly Ile
1295 1300 1305

Asp Cys Val Gly Asp Pro Ser Ser Phe Phe Thr Asn Ala Ser Cys
1310 1315 1320

Asn Ser Ala Gly Pro His Met Phe Gly Ser Ala Gln Gln Ala Asn
1325 1330 1335

Gln Pro Lys Thr Gln His Ile Lys Asn Ile Pro Ser Gly Met Cys
1340 1345 1350

Gln Asn Gln Ser Gly Leu Ala Val Ala Gln Gly Gln Ile Gln Leu
1355 1360 1365

His Gly Gln Gly His Ala Gln Gly Gln Ser Leu Ile Gly Pro Thr
1370 1375 1380

Asn Asn Asn Leu Met Ser Thr Ala Gly Ser Val Ser Ala Thr Asn
1385 1390 1395

Gly Val Ser Gly Ile Asn Phe Val Gly Pro Ser Ser Thr Asp Leu
1400 1405 1410

Lys Tyr Ala Gln Gln Tyr His Ser Phe Gln Gln Gln Leu Tyr Ala
1415 1420 1425

Thr Asn Thr Arg Ser Gln Gln Gln Gln His Met His Gln Gln His
1430 1435 1440

Gln Ser Asn Met Ile Thr Met Pro Pro Asn Leu Ser Pro Asn Pro
1445 1450 1455

Thr Phe Phe Val Asn Lys
1460

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<212> PRT
<213> Drosophila lgs

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<223> Xaa can be any naturally occurring amino acid

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<222> (21)..(22)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (25)..(27)
<223> Xaa can be any naturally occurring amino acid

<400> 24

Xaa Xaa Val Phe Ser Thr Xaa Xaa Ala Asn Lys Xaa Ala Glu Xaa Val
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Leu Xaa Gly Gln Xaa Xaa Thr Ile Xaa Xaa Xaa His
20 25

<210> 25
<211> 35
<212> PRT
<213> Drosophila lgs

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<220>
<221> misc_feature
<222> (28)..(33)
<223> Xaa can be any naturally occurring amino acid

<400> 25

Xaa Xaa Leu Xaa Xaa Xaa Gln Xaa Xaa His Arg Glu Xaa Xaa Leu Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Phe Pro Xaa Xaa Xaa Xaa Xaa
20 25 30

Xaa Gly Ala
35